

WHAT IS CLAIMED IS:

1. A method of manufacturing a magnetic particle, comprising:
the alloy particle preparation step of preparing an alloy particle capable of
forming a CuAu type or Cu₃Au type hard magnetic ordered alloy phase and
5 the magnetic particle formation step;
wherein in said alloy particle preparation step, a plurality of kinds of solutions
for preparing said alloy particle are mixed together and caused to react with each other in
a mixing field by a liquid phase process and at least one of said plurality of kinds of
solutions is mixed by a high-pressure mixing method which involves supplying the
10 solution to the mixing field by a high-pressure jet stream of not less than 1 MPa.
2. The method of manufacturing a magnetic particle according to claim 1, wherein
the particle size of the alloy particle prepared by said mixing and reaction is 1 to 100 nm
and the coefficient of variation in the particle size is not more than 15%.
3. The method of manufacturing a magnetic particle according to claim 1, wherein
15 said liquid phase process is the reversed micelle process and wherein as said plurality of
kinds of solutions, a reversed micelle solution (Solution L1), which is obtained by
mixing a nonaqueous organic solvent containing a surfactant and an aqueous reductant
solution, and a reversed micelle solution (Solutions L2), which is obtained by mixing a
nonaqueous organic solvent containing a surfactant and an aqueous metallic salt solution
20 containing a plurality of kinds of metallic atoms constituting said alloy particle, are
prepared, and at least one of Solution L1 and the plurality of Solutions L3 is supplied as
said high-pressure jet stream of not less than 1 MPa.
4. The method of manufacturing a magnetic particle according to claim 1, wherein
said liquid phase process is the reversed micelle process and wherein as said plurality of
25 kinds of solutions, a reversed micelle solution (Solution L1), which is obtained by
mixing a nonaqueous organic solvent containing a surfactant and an aqueous reductant
solution, and a reversed micelle solution (Solution L3), which is obtained by mixing a
nonaqueous organic solvent containing a surfactant and an aqueous metallic salt solution
containing one of a plurality of kinds of metallic atoms constituting said alloy particle,

are prepared, the number of prepared Solutions L3 being equal to the number of said plurality of kinds of metallic atoms, and at least one of Solution L1 and the plurality of Solutions L3 is supplied as said high-pressure jet stream of not less than 1 MPa.

5. The method of manufacturing a magnetic particle according to claim 1, wherein
5 in said mixing field, all of said plurality of kinds of solutions are caused to collide with each other in as high-pressure jet streams of not less than 1 MPa.

6. The method of manufacturing a magnetic particle according to claim 1, wherein said plurality of kinds of solutions are turbulent flows having a Reynolds number of not less than 10000 during the flow into the mixing field.

10 7. The method of manufacturing a magnetic particle according to claim 1, wherein said plurality of kinds of solutions are supplied from a concentric multiple-cylindrical pipe to a mixing field formed at a leading end of the multiple-cylindrical pipe and are mixed together and caused to react with each other and wherein by use of a static mixing device which discharges a mixed reaction solution from said mixing field, said plurality
15 of kinds of solutions are supplied as turbulent flows having a Reynolds number of not less than 10000 during the flow into the mixing field.

8. The method of manufacturing a magnetic particle according to claim 1, wherein said plurality of kinds of solutions are spouted from the respective nozzles to said mixing field having a diameter larger than a bore diameter of the nozzles and are mixed together
20 and caused to react with each other and wherein by use of a static mixing device which discharges a mixed reaction solution from the outlet having a diameter smaller than a diameter of said mixing field, at least one of said plurality of kinds of solutions is supplied to said mixing field as said high-pressure jet stream of not less than 1 MPa and as a turbulent flow having a Reynolds number of not less than 10000 during the flow into
25 said mixing field, and the remaining solutions are added at a lower pressure than said high-pressure jet stream in a position before the eddy viscosity which the high-pressure jet stream forms with respect to the direction of flow obtains a maximum value.

9. The method of manufacturing a magnetic particle according to claim 8, wherein said remaining solutions are added as orthogonal flows which intersect a straight-ahead flow formed by said high-pressure jet stream almost at right angles.
10. The method of manufacturing a magnetic particle according to claim 8, wherein
5 said high-pressure jet stream is spouted in thin film form into said mixing field.
11. The method of manufacturing a magnetic particle according to claim 1, wherein at least two kinds of metallic atoms constituting the alloy particle capable of forming said CuAu type or Cu₃Au type hard magnetic ordered alloy phase are selected from the Groups 6, 8, 9 and 10 of the long periodic table and at least further one kind of metallic
10 atom is selected from the Groups 11, 12, 13, 14 and 15, the content of said one kind of metal atom being 1 to 30 atom % of the whole alloy.
12. The method of manufacturing a magnetic particle according to claim 1, wherein the mixing and reaction temperature in said alloy particle preparation step is controlled to the range of -5°C to 30°C.
13. The method of manufacturing a magnetic particle according to claim 1, wherein
15 in the magnetic particle formation step of forming a CuAu type or Cu₃Au type magnetic particle from the alloy particle prepared in said alloy particle preparation step, annealing treatment is performed after the application of an alloy-particle-containing solution, which contains the alloy particle prepared in said alloy particle preparation step, to a
20 backing.
14. The method of manufacturing a magnetic particle according to claim 13, wherein the annealing treatment temperature in said annealing treatment is controlled in the range of 100°C to 500°C.
15. A magnetic particle manufactured by the method of manufacturing a magnetic
25 particle according to claim 1.

16. A magnetic recording medium containing the magnetic particle according to claim 15 in a magnetic layer.